




Chelmsford Amateur Radio Society

Newsletter

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Next meeting: 3rd May - 7.30pm, Oaklands Museum

"Introducing Moon Bounce" - John Regnault, G4SWX - RSGB VHF Manager

Inside this issue:

Editorial & Dates for your diary
 Club night preview
 2MT Writtle talk report
 Wireless at the Battle of Jutland
 Marconi: Building the Wireless Age
 CCS7 registration reminder
 M0PSX miscellany
 Table Top Sale reminder
 Hammering it
 April Skills Night
 Marconi's birthday
 IMD 2016 at Sandford Mill



Marconi: Building the Wireless Age Exhibition
Replica of Titanic's Radio Room

Club Nets - Tuesdays 20:00h

Net Controller: TBD

#2 - GB3DA 10th May

#3 - GB3ER 17th May

#4 - 80m 24th May

3.756MHz

#5 - 160m 31st May

1.947MHz

Essex Ham Net

Mondays 20:00h GB3DA

Contact details for the newsletter: editor@g0mwt.org.uk

Editorial

Hello again, and welcome to the latest edition of this newsletter. Apart from the header and footer graphics and table outlines, that sentence is about the only thing I have to with which to start the next Newsletter each month, so it's all downhill from there! Mind you, the possibilities are endless - a bit like infinity:

The lemniscate ∞ is the well-known symbol for infinity, invented by English mathematician John Wallace in 1655, but there is another, that can be represented with just four numbers: $\mathfrak{S} = 9^{9^{9^9}}$

That is $10^{369693100}$ digits if you were to write it out in full, which is going to be impossible, seeing as the age of the universe is less than 10^{18} seconds. Well, it was, before I started typing this, so I guess I can add a few more and, by the time you read it, there will be a few more etc., etc. Anyway, it was created by Carl Gauss (of magnetic fame) to represent a 'measurable infinity', or the number of atoms in the universe, as he didn't like the concept of real infinity. Did he not have enough things to his credit?

There have been so many things happening around and about. IMD, The Marconi Exhibition, CARS Club and Skills Night reports etc. **John, G8DET** sent me this: "*I bumped into an interesting gentleman outside the Marconi Hut on Saturday when I asked*



Wallace >
< Gauss



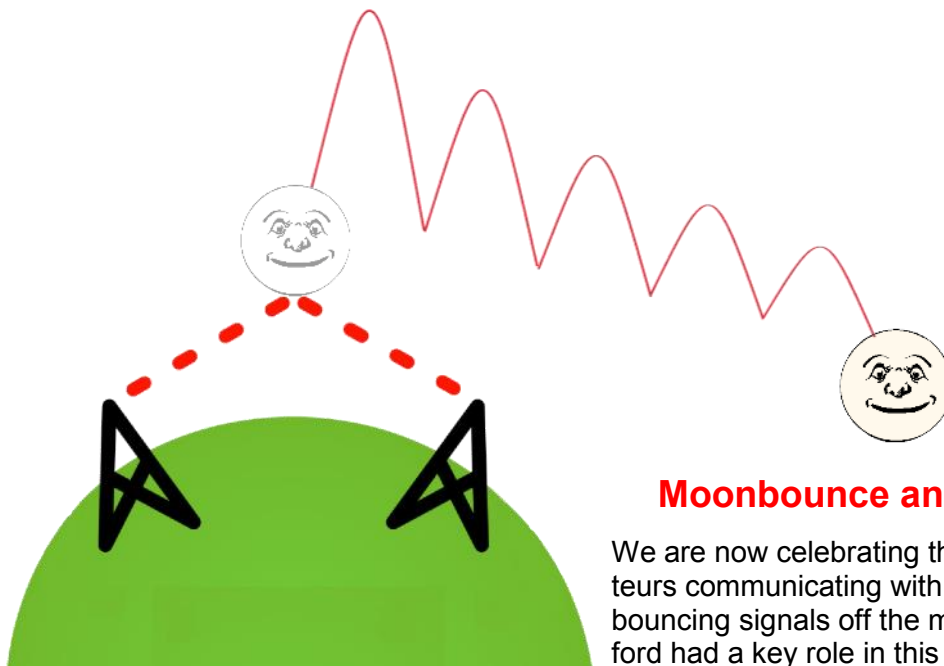
*him if he was involved with Marconi. His name is Peter Crossley; he is in his 80s and now living in Great Baddow. He said he worked for Marconi from 1945 to 1990 with 2 years National Service in the Royal Signals (1952 to 1954) when he was involved with the Coronation. In 1947 he worked in the actual Marconi Hut we were looking at, for a year when it was at Writtle and he was an Apprentice Draughtsman. He had fond memories of it. He said most of his work was on RADAR. Does anyone reading this remember Peter? I have his address and telephone number". It would be nice to see if anyone remembers Peter. **Ed.***

Dates for your diary

Please note, the dates may be subject to change...

Mon. 16th May	Skills Night, Danbury Village Hall
Sat. 28th May	Waters & Stanton Open Day
Tue. 7th June	Meeting - table top sale - explore and declutter the attic/shed/workshop/shack!
Mon. 20th June	Skills Night, Danbury Village Hall
Tue. 5th July	Meeting - "Innovantennas" - Justin Johnson G0KSC
Tue. 2nd August	Meeting - "Constructors Competition" - Carl G3PEM
6th/7th August	Sandford Mill BIG Weekend! An interactive historical extravaganza!
Mon. 15th August	Skills Night, Danbury Village Hall
Tue. 6th September	Meeting - "Millimetric Microwaves" - Chris Whitmarsh G0FDZ
Mon. 19th September	Skills Night, Danbury Village Hall
Tue. 4th October	Meeting CARS Annual General Meeting
Mon. 17th October	Skills Night, Danbury Village Hall
Sun. October 23rd	Science Discovery Day at Sandford Mill
Tue. 1st November	Meeting - 25 minute chats (not 25 @ 1min each...)
Tue. 6th December	Meeting - Christmas Social Evening

Club Night talk 3rd May - John Regnault



Moonbounce and 'DXCC on 144MHz'

We are now celebrating the 52nd anniversary of UK amateurs communicating with others around the world by bouncing signals off the moon. As you will hear, Chelmsford had a key role in this story. In those 52 years amateur technology has developed to the point where moon-

bounce has become a common activity with many thousands of active stations across the world. On 144MHz there is now significant activity almost every day, 24/7, with many DXCC entities being activated by expeditions.

In the talk John Regnault, G4SWX will review some of the history, discuss the propagation challenges and some of technical issues, highlighting how with digital JT65 transmissions, moonbounce is now possible from relatively small 144MHz stations.

John will also describe how he has managed to work 125 DXCC countries and all 50 US States on 144MHz since coming back on the air five years ago, after a break.

John has spent over 35 years operating on 144MHz EME, regularly using both CW and JT65. He has also demonstrated remote moonbounce station operation from many locations including Ofcom headquarters in London and as GB2EME, a special event station from Cambridge University. Although John will focus on 144MHz, his talk will be relevant to moonbounce from 21MHz to the GHz bands.



CCS7 registration reminder

A reminder to club members that if they use D-Star or the DMR Brandmeister networks they need to now register for a CCS7 ID. This is because the German IRCDDb network now has a bridge reflector between the 2 networks and DMR requires a 7 digit ID. The network now automatically transposes call signs with a 7 digit ID to allow the bridge to work.

The Chelmsford D-Star gateway MB6CE normally sits on the IRCDDDB network and if you are not registered you will not be heard on the network when you call CQ. This is separate to the registration that existed previously for the US root network. Users need to register here: <http://register.ham-digital.net>

Regards, **Joel, GOURK**

(Ed's note: Murray, G6JYB states that this is only applicable locally, and to Joel's simplex node MB6CE).

2MT Writtle - The Birth Of British Broadcasting by Tim Wander.

Tim said he was privileged to be asked to present his account of 2MT Writtle this evening as it had been pointed out that he first did it 28 years ago – to the day – but that was when Marconi were in Arbour Lane, Chelmsford. Unfortunately the Marconi Company is no longer and the Marconi Training College in Arbour Lane has now been turned into a housing estate.

Tim said that the public perception of Marconi is that he “invented Wireless” but that is not completely true and then proceeded to build on the brief history of the young man who came to England in 1896 from Bologna, Italy with his mother and his wireless apparatus.

People including Heinrich Hertz, James Maxwell, Oliver Lodge, Michael Faraday, and David Hughes had all been working on the science of electromagnetic waves long before Marconi - but they never considered it be anything more than a laboratory experiment and none of them never actually put together a viable wireless transmission system. Marconi took all the ideas flying around in the late Victorian scientific community, added some crucial developments of his own and effectively showed the Chief Engineer of the British Post Office, (BPO) William Preece - later Sir William - a system that worked.

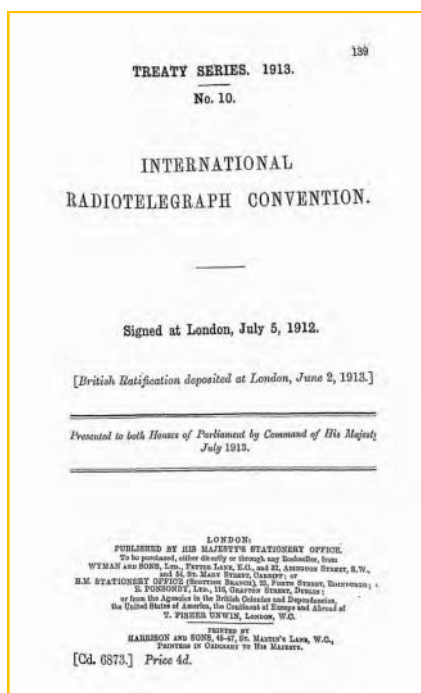
William had himself been developing a “wireless system”, but using electromagnetic induction and had taken it to a point where the range could no longer be extended – so to hear and see Marconi’s approach was very appropriate.

Tim mentioned the quick progression of distances that were covered with the assistance of George Kemp, who later became a faithful assistant to Marconi. Marconi first Patented his system in 1896 when he was just 22.

Tim sketched the remarkable series of milestones completed - showing photographs of the progress as it went on. The Hall Street Works was mentioned as being the world’s first wireless factory – indeed it features recently because the building is listed and about to be turned into flats.

Demand for the wireless equipment from Hall Street was so great the Managing Director, Godfrey Isaacs proposed expansion into a new purpose built wireless factory on two plots of land off New Street, Chelmsford. This huge building scheme was started in February 1912 and employed 500 bricklayers and a lot of skilled personal.

The RMS Titanic had sunk in April 1912, but wireless had saved over 730 persons from drowning – this resulted in yet more orders for Marconi equipment. The New Street Factory was completed in June 1912 and opened its doors to the 250 International Radiotelegraphic Convention created as the direct result of saving lives at sea after the Titanic incident and others.



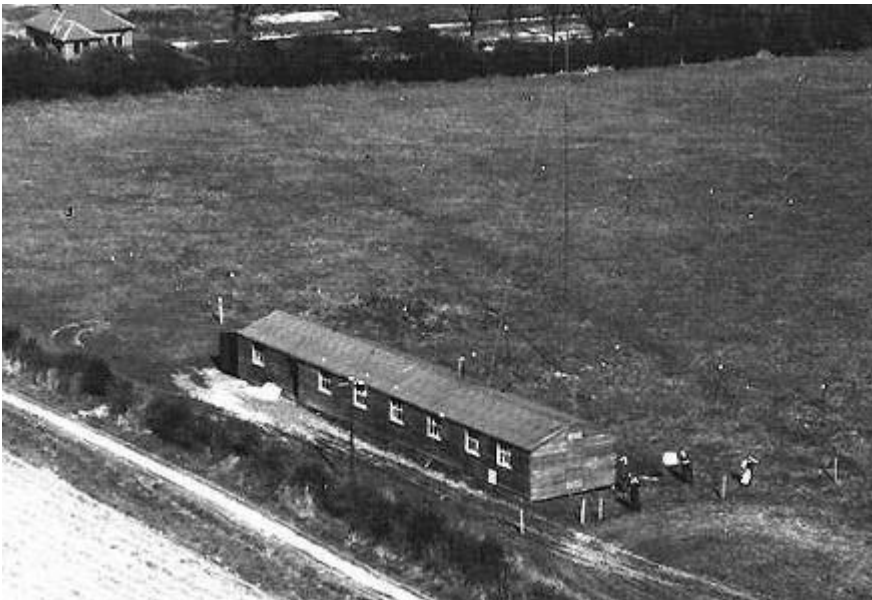
(The International Radiotelegraph Convention and the Service Regulations were revised. There was an absolute recognition of the principle of freedom of intercommunication. In addition, this conference set forth to strengthen the measures relating to the improvement of safety at sea by means of radiotelegraphy. The document, with Q codes, can be found here: [ITU doc Ed.](#))



Transmitters were tested at New Street before being installed in the many ships and buildings around the world – this required two new 450 foot aerials to be built. Reception reports were given to Marconi by letter but very little emphasis was placed on them – after all it was just a private company test transmission. The Daily Mail had followed the progress of wireless and in June 1920 persuaded Dame Nellie Melba with the payment of £1,000 to travel to Chelmsford to “broadcast to the world the first public recital”.

Tim told the now famous story of how, when she was shown the tall aerials that would enable her voice to be heard around the world, she said “Young man, if you think I am going to climb up there you are greatly mistaken. I am Melba.” The recital was a great success and broadcasting had started. Reports were received from Persia and many countries of a similar distance from Chelmsford. However it was thought Marconi was not that impressed with transmitting to the World for free when he was making money sending messages – the BPO thought so as well and only granted Marconi an experimental license to test the new equipment. Unfortunately the huge powers (15kW) and the huge aerials caused great interference across the UK including those involving direction finding and the early air traffic wireless systems at Croydon Aerodrome to the extent the Marconi transmissions were shut down in November 1920.

The public felt otherwise though and pressure resulted in Marconi being granted a license to broadcast, which became station 2MT at Writtle. As the Chelmsford works was busy the new 'broadcasting' job was moved to a converted WWI Army hut in a field in Writtle, some 7 miles from Chelmsford.



The enterprise was under the name of the Marconi Scientific Instrument Company Ltd, Airborne Telephony Wireless Research Division. All those involved had been using Marconi wireless equipment during WWI and so were familiar with it. Captain Peter Eckersley assembled a team around him and started weekly half-hour programs from 14th February 1922 using the catch phrase “2Emma Toc Calling”.

Tim said that Eckersley was a complete character – part Goon Show, part serious world leading engineer – but he and the shows soon had a tremendous public following. The piano had to be carried and pushed

from the Cock and Bull public house to Writtle – used, and then pushed back along only partly made up roads.

Recordings of the impromptu recitals were played as were shown various posed photographs of those involved. Over the brief year of operations 2MT at Writtle firmly laid the foundations of British Broadcasting. In November 1923 it became clear that Broadcasting had a future, but it was not going to be at Writtle and the BPO, desperate to avoid the chaos al-

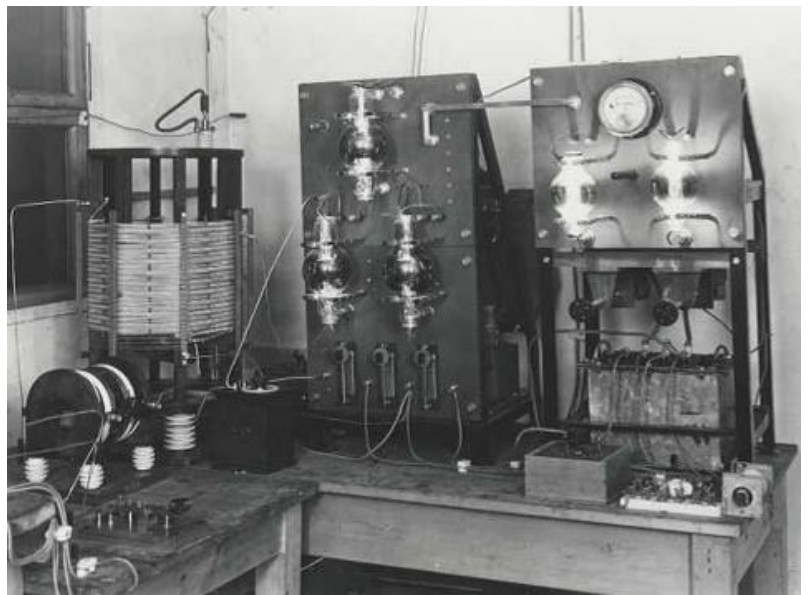




ready ranging across America with huge stations fighting for limited airwave space with huge output powers.

The British Broadcasting Company was formed from 6 leading wireless companies and the first very small Marconi '2LO' station using 100 Watts, which soon increased to 1 ½ kW started operation in 1922. With this station in the centre of London with millions of listeners in range effectively Writtle's career was over - but most of the Writtle engineering team left to join the BBC and Peter Eckersley became the first Chief Engineer. A fascinating, human story about a group of young engineers who made history.

Thank you, Tim for a great evening – see you again in 28 years? **John Bowen, G8DET.**
Tim definitely deserved his reward of a CARS mug - Ed.



Original ^
 vs. replica >
 transmitters

The current
 information
 < board at
 Sandford
 Mill





A visitor operating CW from the original hut during International Marconi Day at Sandford Mill.

Wireless at the Battle of Jutland, 1916, by Dr Elizabeth Bruton.

Elizabeth introduced the subject by saying it was the first major War which had a number of new scientific and technological items for the first time – including wireless and aeroplanes.

The Marconi wireless station at Poldhu (ZZ) announced on 5th August 1914, that Britain was at war with Germany and that all British vessels at sea must avoid German ports – it was also picked up by many hundreds of radio amateurs, who tried to tell contacts but were not believed until the next day, when the newspapers reported the same thing.

The Navy went to sea and trawled the German cables in the English Channel and cut them off, but left a couple which terminated in Cornwall and were found to contain German traffic, which was then passed to London for the length of the war. German transmitting stations were bombed, so forcing the Germans to use more local lower powered transmitters with many unskilled operators.

The British government immediately took control of most parts of Marconi. The New Street factory was transferred to the Navy control for the duration of the war under the chairmanship of Admiral H.W. Grant.

An order was issued throughout the UK which required all amateur transmitters to be closed down and sealed – however, quite soon afterwards radio amateurs and Marconi operators in Chelmsford reported they could copy German telegraphic traffic. Consequently, and quite quickly, the amateurs were approached and recruited to become Voluntary Interceptors (VI's).

The capability of Marconi direction finding equipment from a chain of east coast stations was quite impressive. This meant the majority of German traffic was listened to and its source plotted. Details were sent to "Room 40" in the Admiralty, London where it was decoded, sometimes with the aid of captured German code books.

This enabled the War Office to anticipate that the German Grand Fleet was going to set sail on 31st May with the idea of surprising the Royal Navy. Instead, two major Royal Navy groups set sail at least three hours earlier under Beatty and Jellicoe's command.

Elizabeth said things went a little astray from there on – it was not readily known that the German fleet had left their allocated wireless call-signs in harbour and assumed new ones – this meant the Navy were not told the German fleet had left harbour and were steaming towards Jutland. This confusion also led to some commanders at sea not always trusting information from the shore based Admiralty operations team. The Navy did send back to the Admiralty pretty good reports of what was going on at sea. A 'new'

issue was that the shore-based signals/DF intercepts were so good, the Admiralty was reluctant to forward too much to their ships at sea for fear of the Germans realising they were being tracked/hacked. So decisions were made which were not the best in hindsight. She showed this with examples taken from the documents housed at the National Record Office, Kew. This was fascinating as they were the detailed original records of signals sent.

The actual battle was fought over two days and a couple of major engagements over May 31st – June 1st 1916. Some 6,000 British and 2,500 German sailors died.

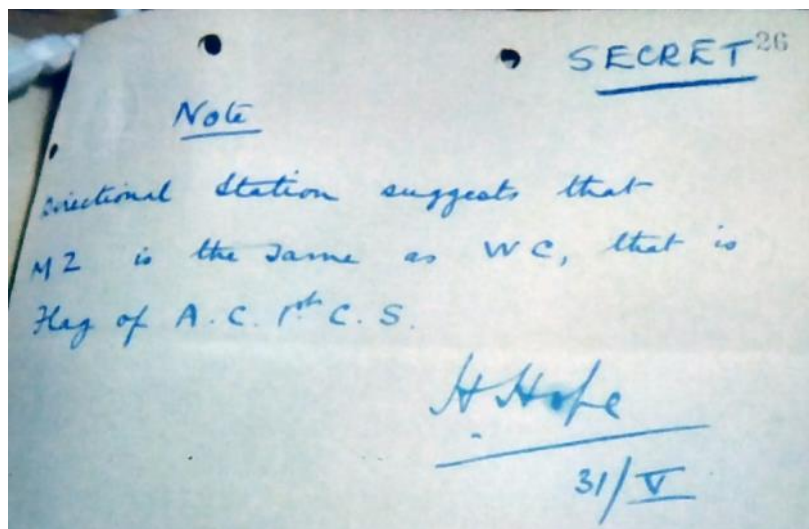
The Germans, with a smaller fleet of 99 ships sank 115,000 long tons of British ships while the 151-strong British fleet sank 62,000 long ton German ships. Both sides claimed victory, but the reality was that the British losses were a small proportion for their strength and were replaced in one month. The Germans realised another battle like this was not sustainable, such that the German fleet abandoned forays into the North Sea, effectively handing the British the overall strategic victory.

In a discussion after Elizabeth's presentation, the question of the British Navy handling of cordite for their guns was raised – it appears that the Navy cordite is somewhat volatile and was stacked up near guns.

This led to internal explosions with dire consequences – sinking a number of British ships.

Elizabeth, thank you so much for sharing your excellent research in a nice and relaxed manner. CARS wish you well in your new appointment as Heritage Officer at Jodrell Bank.

John Bowen, G8DET



Wireless direction-finding

- Based on directive wireless developed by Artom and later Italian electrical engineers Bellini and Tosi
- Bellini-Tosi system purchased by Marconi Company in 1912 and further developed by Marconi engineer HJ Round and others before outbreak of war
- Initial pre-war and wartime experiments and developments at Marconi factory in **Chelmsford** with further tests at Devizes
- **Devizes**: Six high aerial masts arranged in a circle could be used to locate the position of an enemy wireless station



Marconi Direction Finding Set, by
Marconi Company, London, c. 1910.

Early commercial wireless direction-finding set, based on Bellini-Tosi System, Patent 21299/07.

Wireless D/F at Jutland

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A page from the log book for the Marconi Directional Finding Station (probably Scarborough), dated 31 May 1916 showing changes of bearing, which indicate a movement of the German fleet. Marconi Archives, Bodleian Library, University of Oxford. Image courtesy of Bodleian Library, Oxford



Dr. Elizabeth Bruton giving her talk.

Marconi Wireless DF stations provided key SIGINT to the Admiralty via Room-40.

All photos by Murray G6JYB.

Marconi: Building the Wireless Age Exhibition

I finally went along to this exhibition on Sunday 17th April. For various reasons, I had not been able to attend prior to that although I had seen some of the publicity material. At the event I talked to Chris Neale and he told me the story behind the acquisition of the replica radio room that features prominently. Chris was completely unaware of its existence until one day after the exhibition had begun preparations, the replica's owner turned up with a picture of the radio room and asked Chris if he wanted to use it. Chris thought he meant the picture, but then realised he was being offered the original. All well and good, but the owner was to be going on extended holiday within about a week or so, so preparations were rapidly made for the room to be transported to Chelmsford, flatpacked in the back of what Chris described as a "mobile grocer's lorry" from days of yore. Having forgotten my camera, Chris kindly loaned me his and later in the day, emailed me the pictures I took at the event. I asked if he had any background material for the Newsletter and Chris kindly sent me a copy of his application for a grant - not for the fabric of the exhibition, but for the posters. Extracts are copied a few pages further on below.



Chris Neale, Alan Matthews and Pam Swaby curating and caretaking the exhibition; surrounded by the origins of the wireless species, all are dabbling with its ubiquitous progeny: WiFi tablets and phones.



These pictures, taken at a quiet time just before closing show clearly the original nature of the building. Chris estimated that in the limited time since opening there had been about a thousand visitors through the doors, which is quite impressive. The comment book was well used and compliments abounded. Those visitors ranged from the 'old' Marconi employees through generally curious, to casual passers-by.



Application to Chelmsford City Council for a grant to provide displays for an Exhibition**Project Aims:**

To celebrate the history and legacy of Marconi and the Marconi Company in Chelmsford, by presenting the 'Marconi: Building the Wireless Age Exhibition' in the original Grade II listed Marconi Works in Hall Street from 11th March to 29th May 2016.

A unique opportunity has arisen due to the ongoing restoration of Marconi's and the world's first wireless factory in Hall St. Chelmsford. Granting of the planning approval to convert the building into residential units and commercial floor space states, under condition 16:

Prior to the occupation of the last residential unit, a three month exhibition celebrating the history of the building shall have commenced within the commercial floor space of the building unless otherwise agreed in writing by the local planning authority.

Reason: To acknowledge the significant industrial heritage of the building and to allow for members of the public to access and appreciate the heritage asset.

The Marconi Heritage Group in affiliation with the Chelmsford Civic Society has been asked by the developer, MAC Design and Build Ltd., to organise and present this exhibition.

The project benefits:

We see this as a major opportunity to bring this legacy to the attention of the wider public, especially given the rapid, ongoing expansion of Chelmsford City's population along with a clear need to provide an enhanced cultural dimension to the City. Our City entry signs claim this is the 'Birthplace of Radio', but visitors are hard-pressed to see the evidence. Our hope will be that this will lead to a permanent heritage centre within the City centre.

In conjunction with Chelmsford Science and Engineering Society, we also intend to use the facility to run 'hands on' Science and Engineering Clubs for schoolchildren as we see the Marconi legacy as being a powerful inspiration for to-day's budding entrepreneurs!

The Exhibition will give the opportunity to corral much archival material from a variety of sources and make it easily accessible to the public, in many cases for the first time. We anticipate contributions from the International Marconi Museum in Bologna, The Museum of the History of Science, Oxford, the Essex Records Office, Chelmsford Museums and several private collections. Already we are getting interest from local families who have their own small collections of Marconi and Hall street related memorabilia and wish to make them available.

Grant requested:

At this stage we do not know how much material we will receive but have been promised, so far, 16 sets of A0 'poster' size artwork. These need to be printed in full colour and professionally mounted, will cost about £50 for each poster. Thus if we anticipate a total of 20 posters, this will amount to £1000.

How a grant could be used/would help

This is a volunteer led initiative and is entirely dependent on voluntary contributions, both monetary and in kind. This grant would be used to provide high quality, full colour mounted display material which will be supplied to us in digital files from a variety of sources allowing them to be viewed by members of the public and indeed to be available beyond the life of this exhibition for use elsewhere in the City.

This application is being submitted by Chris Neale on behalf of the Chelmsford Civic Society.

The coloured font emphasis above is entirely mine. When you think what Marconi and his company had done for the town, £1000 doesn't really seem like a lot, does it? What are your views? As ever, please let editor@g0mwt.org.uk know. Ed.

M0PSX miscellany

Two SSTV images captured on 13 April 16 by me as part of this month's commemoration of 15 years of ARISS – Background here: <http://www.ariss.org/news.html>

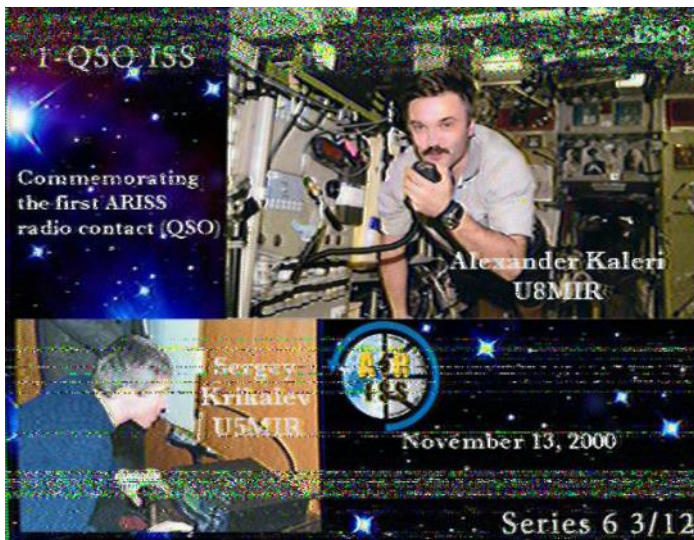


Image of me, Sarah M6PSK and Kathryn (aged 8) “supporting” the 1st of April Sheds Allotments and Greenhouses on the air event - Background - <https://sites.google.com/site/saghotat/>



And two pics from the Galleywood Common Field Day on the 3rd of April - <http://www.essexham.co.uk/news/essex-hams-galleywood-common-03-april-3016.html>.

Pete, M0PSX



It's TTT (or soon will be)

In order to assist with construction and recycling, our June meeting will be a radio and electronics table top sale. Other clubs are also welcome. All sorts of amateur, audio, electrical/electronic, photographic, computer and associated equipment can be offered. To paraphrase, if it's legal, decent and honest, then bring it along. Time to get up in the loft and sort those old bits and pieces out you know you will never use. And what about that stuff at the back of the garage? That needs to go as well! Bring it to:

CARS Table Top Sale: 7th June 2016

Book a table now. Contact Colin, G0TRM. 01245 223835 or email [Colin, G0TRM](mailto:Colin.G0TRM)

Tables are £3. CARS Members can sell for free, but if you do well, a small donation to Club funds would be welcome, up to the maximum table fee of £3.

Not much to sell? Then why not share a table?

Colin, G0TRM

Hammering it

I had a couple of lengths of old imperial copper tubing laying around in the garden. I had saved them after we recently took out the remains of a defunct central heating system. One was about 4' long and the other was about 6' 2". I had wondered if I might be able to use them for some kind of antenna, but they were a bit chunky at 1.1/8" dia. and not strong enough to use as any meaningful antenna support, but I wondered if they would be any good for a ground.

I cleaned up the 6' length and started whacking it into the soft soil by my chosen ATU position. It went easily at first, then not so, so I stopped and pulled it out. Sure enough, there was a plug of soil in the end, so I shifted it by various means and had another go. This went on until I encountered flint shingle in the end of the pipe. That's when it started getting really hard. Anyway, I had to cut the folded end off once, then twice after it absolutely refused to go in any further. Now there is about 8" sticking out of the ground to which I have bolted and soldered a heavy brass tag strip. I cut off 4" + the folded ends, which I estimate to be about 3" (by counting the folds, which are about 1/4" wide), so I reckon I got almost 5' into the ground. Let's hope it proves useful!, and aren't those folded bits pretty?

Ed.



April Skills Night

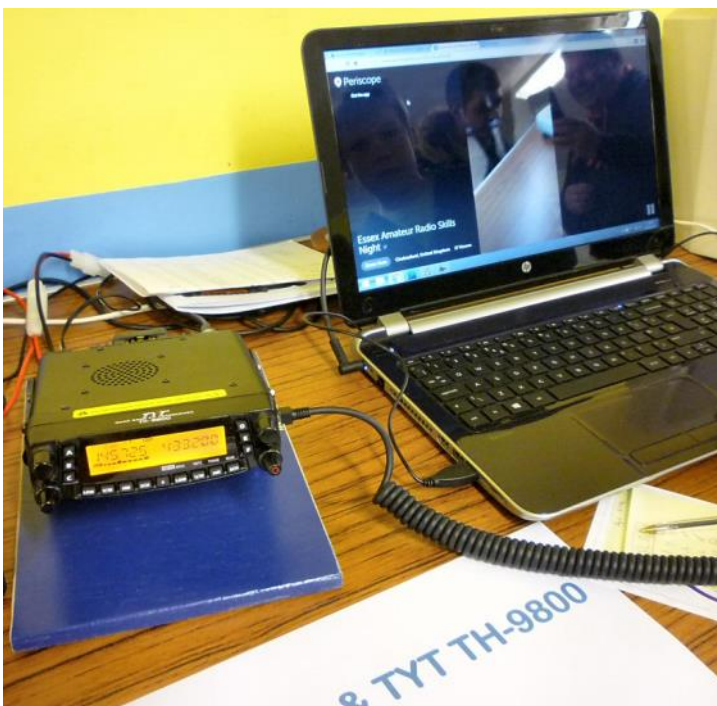
This month's Skill Night was again well attended, with a number in excess of 50 by a quick estimated head-count. The usual mix of demonstrations, 'commercial' & private sales, announcements, quiz and refreshments was enthusiastically received; the cakes being ever popular. Amongst many other things to be seen, on the night the Hawkins Room was given over to Mike G4NVT and his demonstration of his HP test set and he was showing how to align filters and various other pieces of equipment.



Peter Franklin, G1FOA was showing his Summits On The Air (SOTA) equipment and achievements.



Jim, 2E0RMI had his new TYT-TH9800 quad band rig and was using it for Echolink.



The evening was being recorded and sent out live via Periscope. Jim logged on to www.periscope.tv/essexham and proved the link was functional, as did others in the room. A very good evening. **Ed.**



CARS' website g0mwt.org.uk/skills always has up-to-date information and this Newsletter always lags behind, so that is a good site for more current information. In this case though, Steve, M0SHQ was belatedly presented with a CARS mug > for his excellent talk on satellite operation.



Charlie, M0PZT ^ selling his wares



The Marconi H2 connector referred to in the [quiz](#)



James, 2E0JTW & Glynis, 2E0CUQ making the badges that everyone wears



Essex CW club had a demonstration running again, hosted by Dean, G4WQI



Marconi's Birthday



Marconi's Birthday was celebrated by CARS members on Saturday, 23rd April, from Marconi's Hut at Sandford Mill, Chelmsford.

Once Tony, G4YTG, had tuned up the aerial we were well away on 40m with European stations belting in. GX0MWT was obviously a popular callsign, as pile-ups were numerous with over 100 contacts made between 10:30 and 15:30. 20m was a struggle, with a maximum of 50W going out but, again, mostly EU stations coming back.

We had no DX - we can normally manage USA and Japan

in the afternoon when working from the office upstairs with the delta loop. Conditions were not brilliant, sometimes completely dead, but both CW and SSB operators enjoyed their brief time on the key and mic, alternating every hour.

Thank you to all the participants who operated and did some logging.....and especially to Chris, G0IPU, who brought all the gear.

Andy, G0IBN

Keith, G3WGE
and
Dave, G4AJY
operating.



IMD 2016 at Sandford Mill

This event was well attended by both public and CARS members alike. Colin, G0TRM had done a good job of setting up the Morse key display and this looked pretty good.



Setup was quite frenetic, with preparations being made for both HF and 2m in the hope that the public would be able to hear Tim Peake from the ISS. Work had already been done earlier in the week by several people in repairing a fragile HF feeder to the doublet that is permanently installed at Sandford Mill.

Operating began with a CW session with Andy, G0IBN on the key. Later, he was joined by various operators such as Chris, G0IPU, Keith, G3WGE, Dave, G4AJY amongst others, either on the key, mic or logging PC. Many hands make light work...



A brace of Chapmans (Chapmen?)

By about 11:30 it was getting very noisy in the Mill. The HF set was going great guns and the public (or their offspring) were enthusiastically embracing the displays that could be pushed, pulled, hammered, banged or otherwise manipulated. (Isn't it funny how the static displays never seem to draw as much interest?)

Indeed, trying to have a conversation with Adrian, M0ABY who had come 45 miles down from Wheathampstead proved quite difficult.

There was a rather nice Raspberry Pi demonstration of what they termed UDAR or Ultrasonic Detection And Ranging, where a couple of ultrasonic transducers were being employed to detect the positions of some



small 'reflectors'. A nice simple demonstration in only 250 lines of Python and a good visual example that would get the message across to younger visitors.



Kristian, M0SSK was operating the 2m station. He and Ray, 2E0GVE were setting up for Tim Peake's ISS QSOs that day. Right, is an original Marconi broadcast TV camera still functioning and sending closed circuit pictures for the public to appreciate. The quality of these, and some old recorded material, makes you realise how far broadcasting has come. I always thought those archive recordings were only bad due to the archive medium!



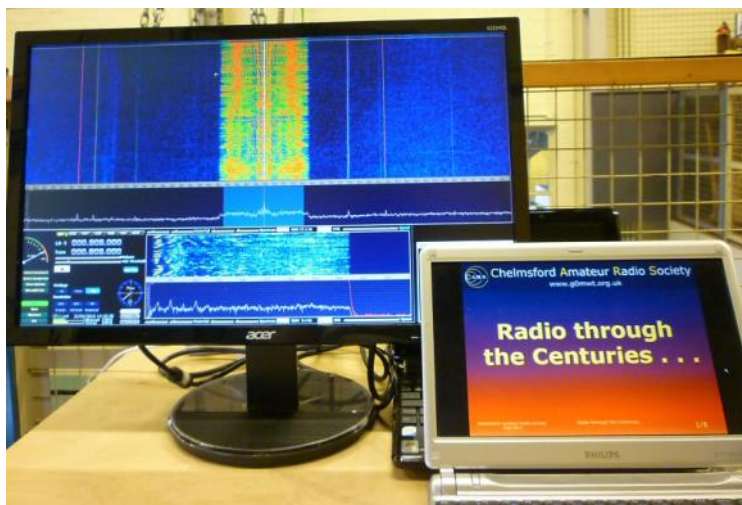
The ubiquitous 'DDD' or digital dongle display that one half of the brace of Chapmans, Andy, G7TKK had brought along for the public's appraisal.

It's perhaps food for thought that Joe public would look at the spectrum display and wonder what on earth is that, and fail to comprehend it. They might be thoroughly confused by the explanation, whereas they would be entirely at home in using the dongle for its original purpose, to show broadcast TV.

Some pictures taken by Murray, G6JYB and a CARS website explanation can be found here: [Sandford](#)



The old
vs. the
new at
the Mill to
delight
and confuse
the public!



Left, Chris, G0IPU setting up the 2m antenna to listen in on Tim Peake's ISS QSO with pupils of Wellesley House School.

Above, helpers and visitors listen to the QSO. Visit CARS' website to listen to the audio in a YouTube clip that was created by Chris and edited by Murray, G6JYB. The link is here: [sandford-mill/imd2016/TimPeake](#)